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FLETCHER, HEALD & HILDRETH, P.L.C.

ATTORNEYS AT LAW

11th FLOOR, 1300 NORTH 17th STREET

ROSSLYN, VIRGINIA 22209-3801

(703) 812-0400

TELECOPIER

(703) 812-0486

INTERNET

HILDRETH@ATTMAIL.COM

ROBERT L. HEALD
(1906-1988)
PAUL D.P. SPEARMAN
(1906-1988)
FRANK ROBERSON
(1906-1981)
RUSSELL ROWELL
(1948-1977)

RETIRED
EDWARD F. KENEHAN
FRANK U. FLETCHER

CONSULTANT FOR INTERNATIONAL AND
INTERGOVERNMENTAL AFFAIRS
SHELDON J. KRYSS
U. S. AMBASSADOR (ret.)

OF COUNSEL
EDWARD A. CAINE*

WRITER'S NUMBER
(703) 812-0480

ANN BAVENDER*
JAMES A. CASEY
KARLEN L. CASBER*
ANNE GOODWIN CRUMP*
VINCENT J. CURTIS, JR.
PAUL J. FELDMAN*
ERIC FISHMAN*
RICHARD HILDRETH
EDWARD W. HUMMERS, JR.
FRANK R. JAZZO
CHARLES H. KENNEDY*
KATHRYN A. KLEMAN
PATRICIA A. MAHONEY
M. VERONICA PASTOR*
GEORGE PETRUTSAS
LEONARD R. RAISH
JAMES P. RILEY
MARVIN ROSENBERG
KATHLEEN VICTORY*
HOWARD M. WEISS

* NOT ADMITTED IN VIRGINIA

May 15, 1995

VIA HAND DELIVERY

Mr. William F. Caton
Acting Secretary
Federal Communications Commission
1919 M Street, N.W. - Room 222
Washington, D.C. 20554

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MAY 15 1995
FEDERAL COMMUNICATIONS COMMISSION
OFFICE OF SECRETARY

Re: IC Docket No. 94-31

Dear Mr. Caton:

Attached are an original and seven (7) copies of "Late Further Reply Comments" on the Second Notice of Inquiry in the above cited Docket. The Commission is urged to take these late Further Reply Comments into account as it proceeds with its final preparations of U.S. proposals and positions for WRC-95.

If there are any questions, please call the undersigned at (703) 812-0480 or fax at (703) 812-0486.

Respectfully submitted,

FLETCHER, HEALD & HILDRETH, P.L.C.

Leonard Robert Raish

Leonard Robert Raish

On behalf of Parties Involved*

LRR:cej
Enclosures

*See footnote on page 1 of the attached filing for list of parties involved.

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BEFORE THE

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MAY 15 1995

FEDERAL COMMUNICATIONS COMMISSION
OFFICE OF SECRETARY

In the Matter of)
)
Preparation for International) IC Docket No. 94-31
Telecommunications Union World)
Radiocommunications Conferences)

To: The Commission

**LATE FURTHER REPLY COMMENTS ON
SECOND NOTICE OF INQUIRY**

In the Second Notice of Inquiry for the above-captioned proceeding, the Commission proposes reallocating the upper 6 GHz (6.525-6.875 GHz), 11 GHz (10.7-11.7 GHz), and 18 GHz (17.7-19.7 GHz) bands to accommodate Non-Geostationary Mobile Satellite Service (NGSO MSS) feeder links. Under this proposal, terrestrial fixed microwave service ("FS") users, which have been allocated those bands on a primary basis, would be required to share them with NGSO MSS feeder links on a co-primary basis. As demonstrated in these Late Further Reply Comments, which are being filed to ensure a complete record in this proceeding, the Commission's proposal, if adopted, would have a disastrous impact on the FS industry and on the PCS industry.¹

¹On May 8, 1995, the Commission published a NEWS Release that it had received the Final Report of its Industry Advisory Committee (IAC) on preparations for the 1995 World Radiocommunications Conference (WRC-95). The IAC's Final Report contains sections prepared by its six Informal Working Groups (IWGs). The section prepared by IWG-4 (dealing with MSS feeder links) was not concurred in its entirety by the parties filing these late Reply Comments because IWG-4 recommends sharing of the upper 6, 11 and 18 GHz bands.

In an attempt to reach an industry consensus on avoiding this problem, the FS interests have provided the NGSO MSS interests with a compromise plan, which is detailed herein. The FS industry hopes the NGSO MSS industry will look to the best interests of all wireless users and cooperate in resolving the spectrum sharing issues.

The upper 6, 11 and 18 GHz bands are allocated on a primary basis for FS. To clear spectrum for PCS, the Commission has required that FS users migrate from the 2 GHz band to bands above 3 GHz.

The upper 6 and 11 GHz bands, which already are acutely congested, will be prime location bands for the displaced 2 GHz FS users. Moreover, PCS licensees will use FS networks in the upper 6, 11 and 18 GHz bands to support their operations. If the upper 6, 11 and 18 GHz bands are reallocated on a co-primary basis for NGSO MSS feeder links, the following damage would occur:

- Approximately 30% of the upper 6 GHz band, which already is congested and which has been allocated for FS users being displaced to clear 2 GHz spectrum for PCS, effectively would be lost due to FS channel pairing requirements. This is especially critical because the Commission proposes allocating the 6825-6875 MHz band, and IWG-4 proposes allocating the 6650-6875 MHz bands, for NGSO MSS feeder links. Even though these already congested bands will be used by 2 GHz FS users clearing spectrum for PCS, there is no documented need that the same bands must be used for NGSO MSS feeder links.
- A comparable amount of the 11 GHz band, which also has been allocated for displaced 2 GHz FS users, likewise would be lost.
- The harmful interference from NGSO MSS feeder links to FS users, and significant decrease in usable spectrum, threaten public safety, utility and other FS users which require very high path reliability of 99.999% or higher.

In Reply Comments timely filed, the FS manufacturers and user interests, listed in the footnote below,² advised the Commission of these serious negative consequences that implementations on the proposed NGSO MSS feeder link reallocation would have on their industries.

In an attempt to resolve this problem, representatives of the FS and MSS interests met on May 3, 11, and 12, 1995 to discuss possible courses of action that would assist the Commission in finalizing U.S. proposals for WRC-95. The FS interests realize that the proposed reallocation of the upper 6, 11 and 18 GHz bands on a co-primary basis for NGSO MSS feeder links might be changed during WRC-95. Nonetheless, it is extremely critical that the Commission consider fully the potentially catastrophic impact that this proposed reallocation would have on both the FS and the PCS industries. Thus, the FS interests are filing a Statement of Non-Concurrence with IWG-4 reflecting this need for the U.S. delegation to address the impact on their industry and on the PCS industry during WRC-95.

In addition to the global allocation proposals for NGSO MSS to be considered at WRC-95, specific spectrum sharing issues for FS and NGSO MSS feeder links also must be considered by the Commission. These issues are relevant to the WRC-95 deliberations and will be

²The parties to this filing are:

- (a) Alcatel Network Systems Inc. (Alcatel)
- (b) American Petroleum Institute (API)
- (c) The Association Public-Safety Communications Officials International (APCO)
- (d) Association of American Railroads (AAR)
- (e) AT&T
- (f) Harris Corporation - Farion Division (Harris)
- (g) Fixed Point-to-Point Communications Section, Network Equipment
Division of the Telecommunications Industry Association (TIA)
- (h) UTC, The Telecommunications Association (UTC)

especially relevant during any Commission rule making proceeding to adopt technical rules for NGSO MSS feeder link operations.

During the May 1995 industry meetings, the FS interests submitted several constructive, good faith compromise proposals to the NGSO MSS interests to solve the sharing problem. These proposals, which are set forth below, must serve as the platform for accommodating NGSO MSS feeder links in FS bands as WRC-95 and subsequent related Commission rule makings evolve. These proposals are:

1. The Commission has proposed that the 6825-7075 MHz band be allocated for NGSO MSS feeder links on a co-primary basis with FS, and the IWG-4 has recommended adding the 6650-6825 MHz band to this allocation for NGSO MSS feeder links (see attached diagram). The Commission is urged to oppose reallocation of the 6650-6825 MHz band for NGSO MSS feeder links because no demonstrated demand for this spectrum exists. Moreover, the United States proposals to the WRC-95 should advocate that only the spectrum for which there has been a demonstrated need should be made available for feeder links. The Commission is urged further to recommend that WRC-95 require that the 6875-7075 MHz band be totally utilized for NGSO MSS feeder links before the 6825-6875 MHz band (which is part of the upper 6 GHz band where 2 GHz FS licensees will relocate to open spectrum for PCS) could commence being used. If this recommendation for limiting availability of the 6650-6825 MHz band is not adopted, then the Commission should, in rules promulgated later for licensing of U.S. carriers to use NGSO MSS feeder links, include the foregoing limitation.
2. Satellite earth station receivers recognized are more susceptible to interference than comparable FS receivers. This difference unduly constrains the co-location of FS equipment near satellite earth stations. To remedy this imbalance, the Commission should plan to impose restrictions on the location and the number of NGSO MSS earth stations to ensure against harmful interference between such earth stations and FS facilities in the upper 6, 11 and 18 GHz bands. Specifically, the Commission should plan to restrict the

location of NGSO MSS earth stations to avoid densely populated areas and it should impose a maximum limit on the number of such earth stations that could be placed into operation in the U.S.

3. As an alternative to using the 6825-6875 MHz band for NGSO MSS feeder links, the Commission should evaluate the merits of the 12.7-13.25 GHz band.
4. The Commission should recognize that the criteria used under Part 25 of its Rules to calculate interference from satellite facilities into FS facilities are much less protective than the criteria under Parts 21 and 94 to protect FS facilities. For example, see FCC Rules Section 25.252 footnote 1 and Attachment B hereto.
5. The United States proposals to the ITU should not preclude the right of individual administrations to determine their own coordination criteria between terrestrial and satellite services.
6. The FS interests have offered to convene an industry working group with NGSO MSS interests to work on these technical proposals, while the WRC-95 process unfolds.

In conclusion, the Commission is urged most strongly to take these Further Reply Comments, although late, into account as it completes preparation of the U.S. proposals to WRC-95 and as it prepares technical rules for implementing these new allocations..

Respectfully submitted,

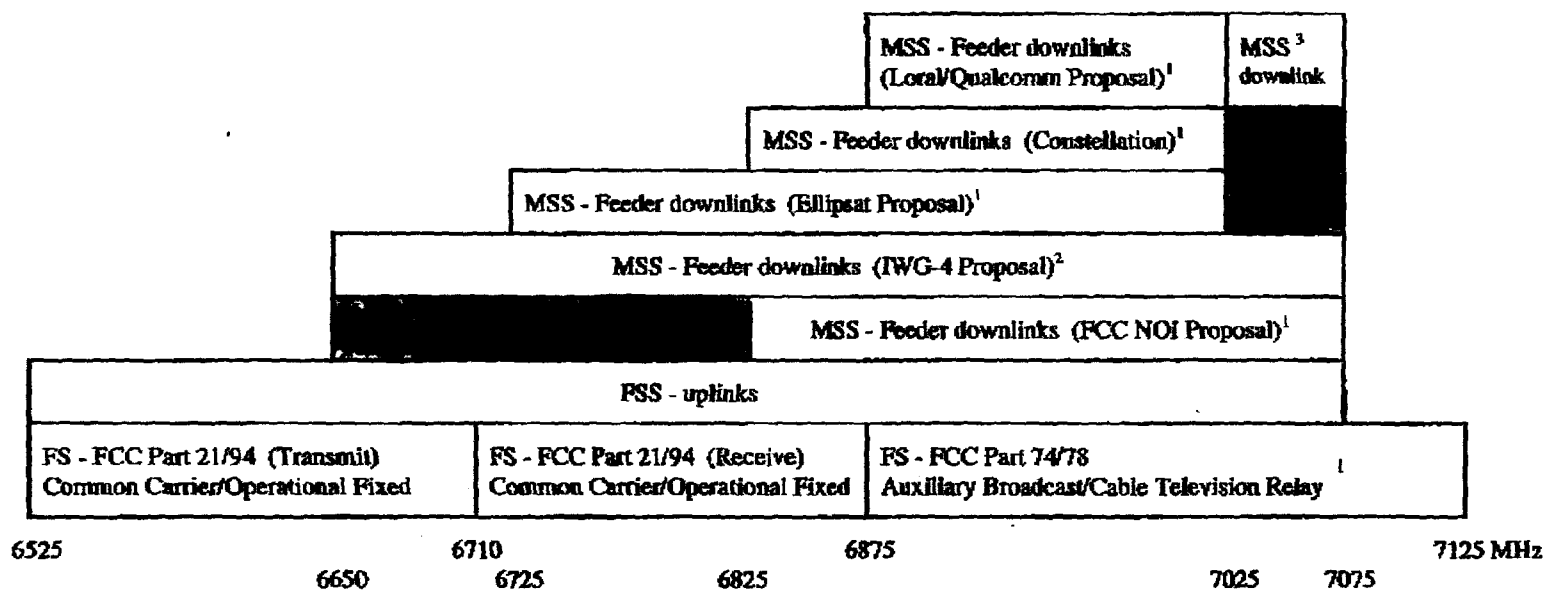
By: Leonard Robert Raish
 Leonard Robert Raish
 For the Convenience and on behalf of
 FS manufacturers and Users³

Dated: May 15, 1995

cej/lrr/r#4/IC9431.plead

³See Footnote on page 1 for names of the FS manufacturers and users.

MSS Non-Geostationary Satellite Feeder Links
Spectrum Sharing Proposals for the 6525-7125 MHz Band



References:

1. FCC Second Notice of Inquiry, IC Docket No. 94-31, Released: January 31, 1995.
2. Final Report of Informal Working Group 4, FCC Industry Advisory Committee for the ITU 1995 World Radio Conference.
3. Loral/Qualcomm also requests the 7025-7075 MHz band (source: Jay Ramasastry of Loral/Qualcomm).

MSS = Mobile Satellite Service
 FSS = Fixed Satellite Service
 FS = Fixed Service

Summary of Spectrum Proposals

Frequency Band	FCC NOI Proposal ^a		IWG-4 Proposal ^b	
	Uplink (MHz)	Downlink (MHz)	Uplink (MHz)	Downlink (MHz)
5.0 - 5.25 GHz	250 (160) ¹		250 (160) ¹	
6.5 - 7.1 GHz		250		425
10.7 - 11.7 GHz	500		500	
12.7 - 13.25 GHz		500		500
15.4 - 15.7 GHz	300		300	
17.7 - 20.1 GHz	300	500	1300 / 0 / 900 ²	400 / 500 / 500 ²
28.5 - 30.0 GHz	500		400 / 500 / 500 ²	

Total Spectrum	FCC NOI Proposal ^a		IWG-4 Proposal ^b	
	Uplink (MHz)	Downlink (MHz)	Uplink (MHz)	Downlink (MHz)
Requirements:				
4-8 GHz	200 / 400 ³	200 / 400 ³	200 / 400 ³	200 / 400 ³
8-16 GHz	200 / 400 ³	200 / 400 ³	200 / 400 ³	200 / 400 ³
16-30 GHz	200 / 500 ³	200 / 500 ³	250 / 500 ³	250 / 500 ³
Proposed Allocation:				
4-8 GHz	250 (160) ¹	250	250 (160) ¹	425
8-16 GHz	800	500	800	500
16-30 GHz	800	500	1700 / 500 / 1400 ²	400 / 500 / 500 ²

Notes:

1. Due to sharing limitations with MLS, only 130 to 160 MHz of clear spectrum may be available for MSS feeder links in areas of heavy MLS usage.
2. Spectrum shown is for the three IWG-4 proposals for the Ka-Band.
3. The first number is the spectrum requirement, assuming that sharing is possible between two MSS systems. The second number assumes that sharing is not possible.

References:

- a. FCC Second Notice of Inquiry, IC Docket No. 94-31, Released: January 31, 1995.
- b. Final Report of Informal Working Group 4, FCC Industry Advisory Committee for the ITU 1995 World Radio Conference.

Modulation	Theoretical C/N for 10 ⁻⁴ BER (dB) *	Typical Co-channel T/I (dB)	Theoretical Spectral Efficiency (bps/Hz)	Typical Data Input Mbps (Bauds, GHz)	b, Spectrum Bandwidth† (MHz) (Symbol Rate, Mbps)	R, Spectrum Amplitude‡ (dBm/Hz) Below the Average Tx or Rx Power
4L FSK	17.6	23.6	2	13 (18)	6.5	-32.1
QPSK, OQPSK	13.5	19.5	2	45 (18)	22.5	-37.5
9 QPR	16.5	22.5	2	6.4 (2)	3.2	-26.0
25 QPR	20.8	26.8	3.17	13 (2, 10)	4.1	-27.1
16 QAM	20.9	26.9	4	90 (6, 11)	22.5	-37.5
49 QPR	23.5	29.5	4	19 (2, 6, 10)	4.8	-27.8
				13 (2, 10)	3.3	-26.1
32 QAM	24.0	30.0	5	13 (2, 6)	2.6	-28.1
81 QPR	25.5	31.5	4.64	45 (2, 6)	9.7	-30.8
64 QAM	27.1	33.1	6	45 (2, 6)	7.5	-32.7
128 QAM	30.1	36.1	7	155 (6, 11)	22.5	-37.5
256 QAM	32.6	38.6	8	19 (2)	2.4	-27.8
512 QAM	35.5	41.5	9	155 (6)	17.2	-36.3

† b = bit rate, Mbps / efficiency, bps/Hz
QPSK and QAM: spectra 3 dB points
QPR: spectrum control lobe width

‡ QAM/QPSK: $R = 10 \log (4 / \text{kbaud})$
QPR: $R = 3 + 10 \log (4 / \text{kbaud})$
(Assumes 4 kHz measurement bandwidth)

* See, Table 1-A, ITU-R Recommendation xxx on "Characteristics of Digital Radio-Relay Systems below about 17 GHz",
(from former Report 378-6, modified).

Table B-1 — Typical Digital Microwave Noise and Spectral Characteristics.

CERTIFICATE OF SERVICE

I, Chellestine Johnson, a secretary in the law firm of Fletcher, Heald & Hildreth, P.L.C., do hereby certify that copies of the foregoing "Late Further Reply Comments" were sent this 15th day of May, 1995, by hand delivery and first-class United States mail, postage prepaid, to:

Scott Blake Harris, Esquire (BY HAND)
Bureau Chief
International Bureau
Federal Communications Commission
2000 M Street, N.W.
Washington, D.C. 20554

Tom Tycz (BY HAND)
Division Chief
Satellite & Radio Communications Division
International Bureau
Federal Communications Commission
2000 M Street, N.W.
Washington, D.C. 20554

Regina Keeney, Esquire, Chief (BY HAND)
Wireless Bureau
Federal Communications Commission
2025 M Street, N.W., Room 5002
Washington, D.C. 20554

William E. Kennard, Esquire (BY HAND)
General Counsel
Federal Communications Commission
1919 M Street, N.W., Room 614
Washington, D.C. 20554

Daniel Phythyon, Esquire (BY HAND)
Senior Legal Advisor
Wireless Bureau
Federal Communications Commission
2025 M Street, N.W., Room 5002
Washington, D.C. 20554

Cecily Holiday (BY HAND)
Deputy Division Chief
Satellite & Radio Communication Division
International Bureau
Federal Communications Commission
2000 M Street, N.W.
Washington, D.C. 20554

William Luther (BY HAND)
Branch Chief
Radiocommunication Policy Branch
International Bureau
Federal Communications Commission
2000 M Street, N.W.
Washington, D.C. 20554

Thomas Walsh (BY HAND)
International Bureau
Federal Communications Commission
2000 M Street, N.W.
Washington, D.C. 20554

Damon C. Ladson (BY HAND)
International Bureau
Federal Communications Commission
2000 M Street, N.W., Room 803
Washington, D.C. 20554

John Reardon, Esquire
Keller & Heckman
1001 G Street, N.W. - Suite 500W
Washington, D.C. 20001
Attorney for API

Ralph A. Haller (BY HAND)
Wireless Bureau
Federal Communications Commission
2025 M Street, N.W., Room 5002
Washington, D.C. 20554

Robert McNamara (BY HAND)
Wireless Bureau
Federal Communications Commission
2025 M Street, N.W., Room 5322
Washington, D.C. 20554

William Rummier
AT&T Bell Labs.
101 Crawford's Corner Road
Room 2E-508
Holmdel, N.J. 07733

Robert M. Gurss
Wilkes, Artis, Hedrick & Lane, Chartered
1666 K Street, N.W., #1100
Washington, D.C. 20006
Attorney for APCO

Mr. John Wengrynuik
c/o COMSAT Laboratories
22300 Comsat Drive
Clarksburg, Maryland 20871-9475

Jeffrey L. Sheldon
General Counsel
UTC
1140 Connecticut Avenue, N.W. - Suite 1140
Washington, D.C. 20036

Leslie A. Taylor
Leslie Taylor Associates
6800 Carlynn Court
Bethesda, Maryland 20817-4302
Attorney for E-SAT, Inc.

International Transcription Service, Inc.
2100 M Street, N.W.
Suite 150
Washington, D.C. 20037

Albert Halprin
Stephen Goodman
Halprin, Temple & Goodman
1100 New York Avenue, N.W.
Suite 650 East Tower
Washington, D.C. 20005
Attorney for Orbital Communications Corp.

Barry Lambergman, Esquire
Manager, Satellite Regulatory Affairs
Motorola, Inc.
1350 I Street, N.W., Suite 400
Washington, D.C. 20005

Paul R. Rodriguez
Stephen D. Baruch
Leventhal, Senter & Lerman
2000 K Street, N.W., Suite 600
Washington, D.C. 20006
Attorneys for Starsys Global Positioning, Inc.

William R Lye
President
National Spectrum Managers Assn., Inc.
RR 7, Box 87
Fulton, New York 13069

George M. Kizer
Chairman
Fixed Point-to-Point Communications
Section Network Equipment Division of the
Telecommunications Industry Association
2500 Wilson Blvd., Suite 300
Arlington, VA 22201

Robert A. Mazer, Esquire
Rosenman & Colin
1300 19th Street, N.W., Suite 200
Washington, D.C. 20036
Attorney for Leo One USA Corporation

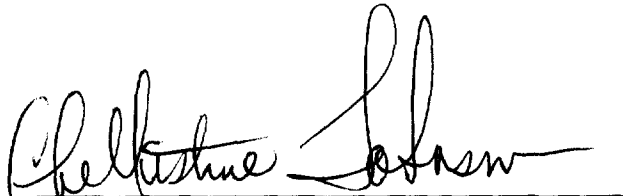
Thomas Keller, Esquire
Verner, Liipfert Bernhard
McPherson & Hand, Chartered
901 15th Street, N.W.
Suite 700
Washington, D.C. 20005-2301
Attorney for AAR

Mr. Gene Rappaport
AT&T
Room 5A-210A
900 Rte 202-206N
Bedminister, N.J. 07921

Robert J. Miller, Esquire
Jeffrey D. Jacob, Esquire
Gardere & Wynne, L.L.P.
1601 Elm Street, Suite 3000
Dallas, TX 75201
Of counsel NSMA and TIA

Denis Couillard
Manager, Regulatory Affairs
International and Domestic
Harris-Farinon Canada
3 Hotel-de-Ville
Dollard-des-Ormeaux
Quebec, Canada H9B-3G4

Mr. Jay Ramasastry
c/o LORAL/QUALCOM
1233 20th Street, N.W. - Suite 202
Washington, D.C. 20036



Chellestine Johnson